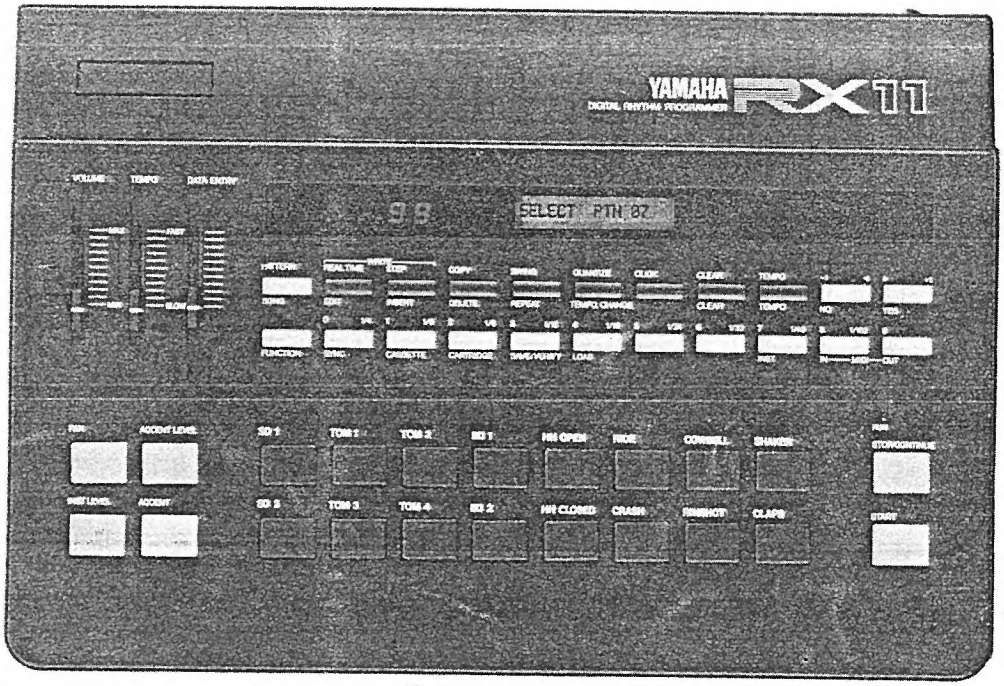
DIGITAL RHYTHM PROGRAMMER

RX11

SERVICE MANUAL

RX11



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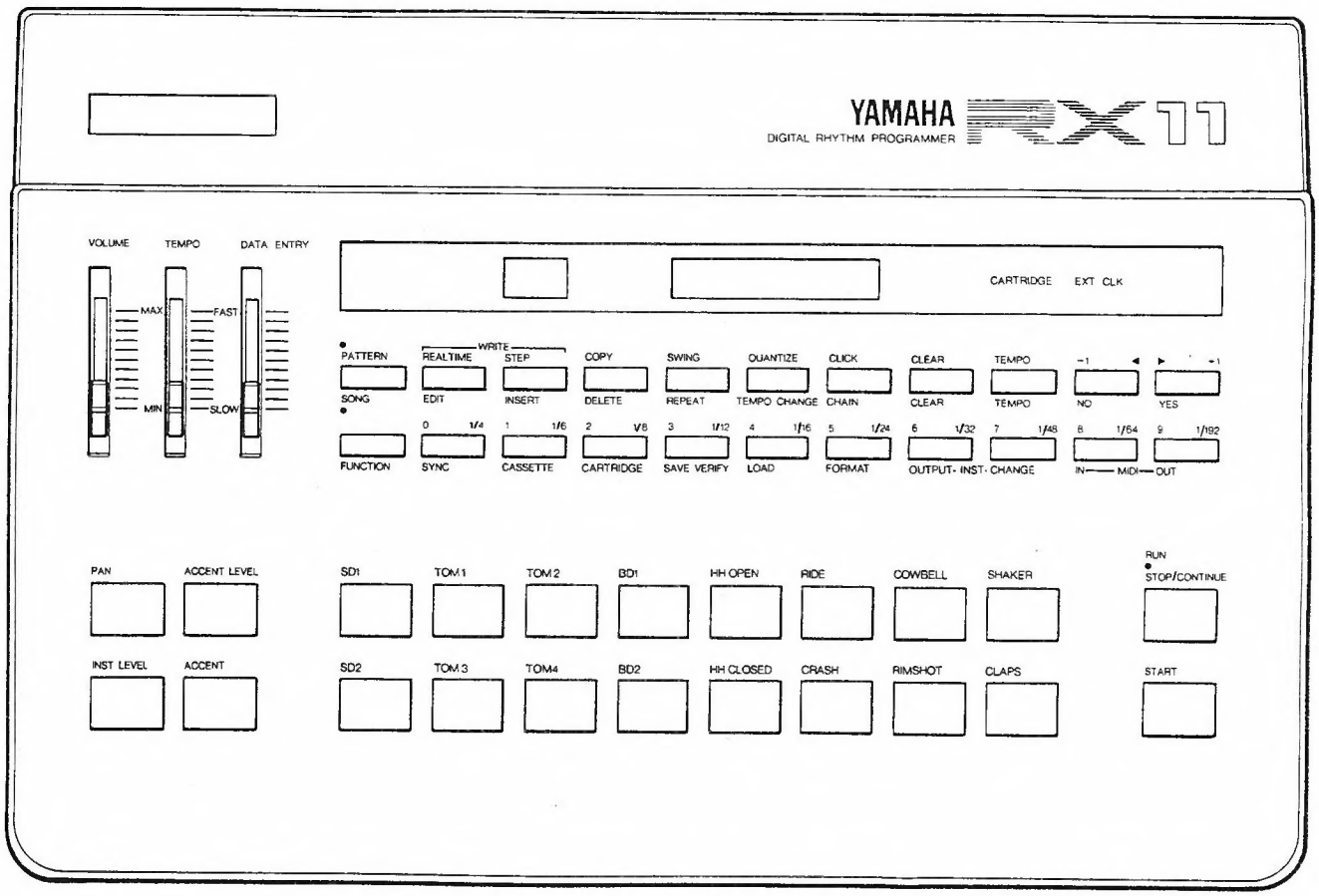
SCHEMATIC DIAGRAM (回路図)

006612

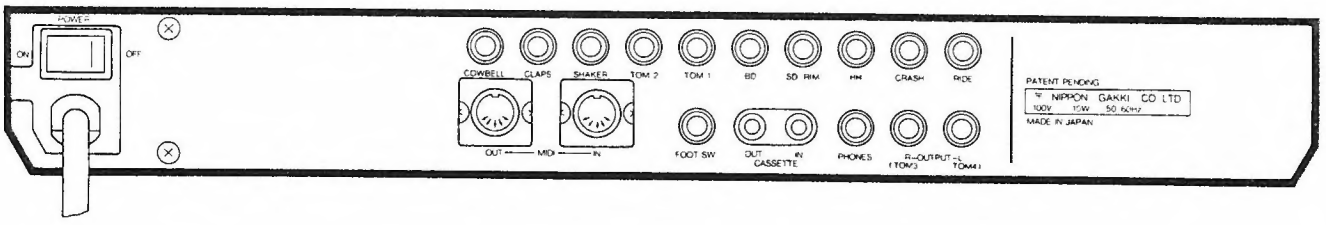
SINCE 1887 YAMAHA
NIPPON GAKKI CO., LTD. HAMAMATSU, JAPAN
2,75K-142 Printed in Japan '84.9

■PANEL LAYOUT(パネルレイアウト)

● FRONT PANEL



● REAR PANEL



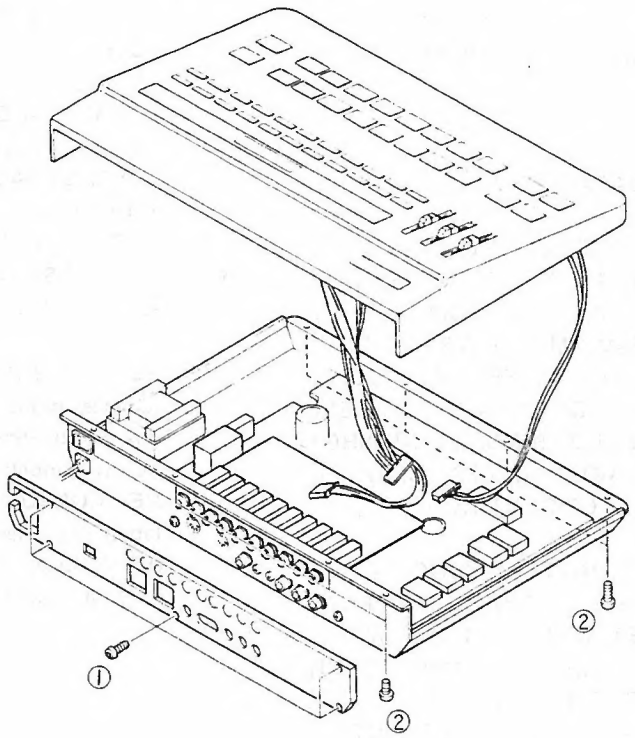
SPECIFICATIONS(仕様)

- SOUND SOURCE(音源)
  - ROM : 256K BIT WAVE ROM x 6
  - Number of voice: 29
- MEMORY CAPACITY(メモリー容量)
  - Number of the PATTERNS: 100
  - Number of the SONGS: 10
  - Maximum Number of the parts within SONGS: 255
- MEMORY PARAMETERS (メモリーパラメーター)
  - PATTERN: INSTRUMENT. ACCENT
  - SONG: PAN, INST LEVEL, ACCENT LEVEL, EDIT (PATTERN NUMBER, REPEAT, TEMPO CHANGE)
- CONTROLLERS(コントローラー)
  - Slider:
    VOLUME, TEMPO, DATA ENTRY
  - Button:
    PAN, INST LEVEL, ACCENT LEVEL, ACCENT, INSTRUMENT [SD 1, 2 (HEAVY/MEDIUM/LIGHT/HI TUNE 1 ~ 5), TOM 1, TOM 2, TOM 3, TOM 4, BD 1, 2 (HEAVY/MD 1/MD 2), HH OPEN (OPEN 1/OPEN 2), HH CLOSED (CLOSED 1/CLOSED 2/PEDAL), RIDE, CRASH, COWBELL (COWBELL 1/COWBELL 2), RIMSHOT (RIMSHOT 1/RIMSHOT 2), SHAKER, CLAPS (CLAPS 1/CLAPS 2)], START, STOP/CONTINUE.
  - Key:
    MODE SELECTOR (PATTERN/SONG, FUNCTION), PATTERN MODE PARAMETER (REAL TIME WRITE, STEP WRITE, COPY, SWING, QUANTIZE, CLICK, CLEAR, TEMPO), SONG MODE PARAMETER (EDIT, INSERT, DELETE, REPEAT, TEMPO CHANGE, CHAIN), FUNCTION MODE PARAMETER (SYNC, CASSETTE, CARTRIDGE, SAVE/VERIFY, LOAD, FORMAT, INST OUTPUT, INST CHANGE, MIDI IN, MIDI OUT), NUMBER (0 ~ 9, 1/4 ~ 1/192), +1/YES, −1/NO
  - Switch:
    POWER SWITCH
- DISPLAY(ディスプレイ)
  - LCD: 16 CHARACTERS
  - LED DISPLAY: 7 SEGMENTS x 2 COLUMNS
  - LED INDICATOR: PATTERN, SONG, CARTRIDGE, EXT CLK, RUN
- CONNECTION TERMINALS AND INTERFACES (接続端子・インターフェイス)
  - AUDIO OUTPUT: INDIVIDUAL INSTRUMENT OUTPUT
    (COWBELL AND ~ RIDE 10 CH) OUTPUT
    L/TOM 4 AND R/TOM 3 (phone jack), PHONES (stereo phone jack, 8 ~ 40 ohms)
  - CONTROL JACK: FOOT SW
  - INTERFACE: CARTRIDGE, CASSETTE (IN, OUT), MIDI (IN, OUT)
- DIMENSIONS AND WEIGHT (寸法・重量)
  - 400W x 68H x 270D (mm)
  - 3.1 KG
- POWER REQUIREMENTS
  - Japanese model: 100V 50/60Hz
  - U.S. & Canadian models: 120V 60Hz
  - General model: 110-130V/220-240V 50Hz
- POWER CONSUMPTION
  - Japanese model: 10W
  - U.S. & canadian models: 15W
  - General model: 15W

DISASSEMBLY PROCEDURES(分解手順)

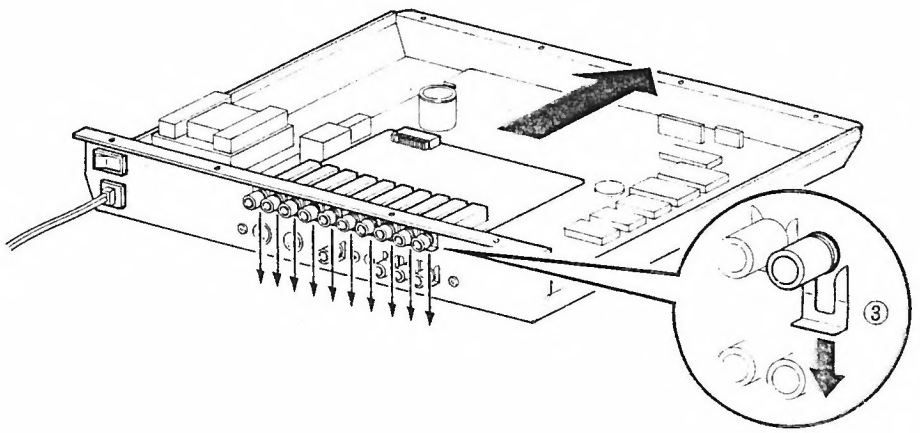
- **Removal of Rear Cover**
  a. Remove the 5 screws marked ①.
  b. Remove the rear cover from back of the chassis.
- **Removal of Top Cover**
  a. Remove the 8 screws marked ②.
  b. Remove 5 connectors by lifting the top cover up.

- **リアカバーのはずし方**
  a．①のネジ５本をはずす。
  b．リアカバーを後方へはずす。
- **トップカバーのはずし方**
  a．②のネジ８本をはずす。
  b．トップカバーを持ち上げ、コネクター5個をはずす。



- **Removal of AN Circuit Board.**
  a. Remove U-shaped metal fittings marked ③ by pulling them downward.
  b. Pull AN circuit board in the direction of the arrow.

- **ＡＮシートのはずし方**
  a．③のＵ字金具10個を下方へ引いてはずす。
  b．ANシートを矢印の方向へはずす。



RX11 ADDRESS MAP (アドレスマップ)

RX11 ADDRESS MAP is shown in Table 1.

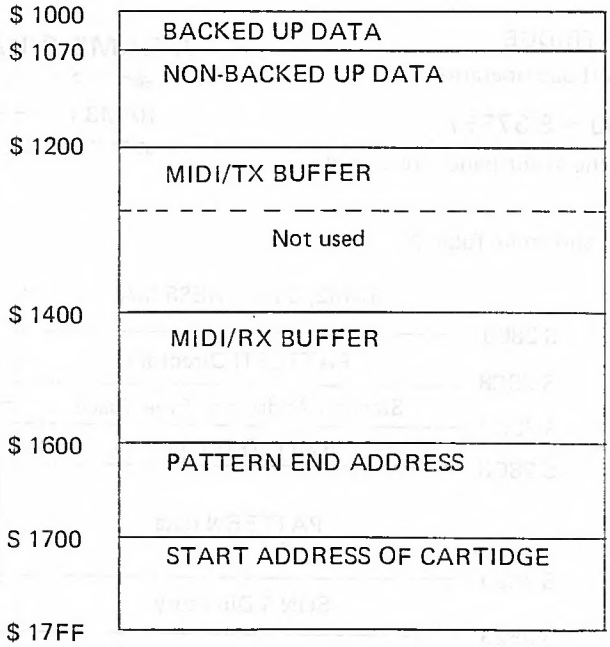
RX11のアドレスマップはTable 1のようになっています。

Table 1

ADDRESS	DESCRIPTION
$ 0020	Switch matrix data
$ 0022	LCD control
$ 0023	LCD data
$ 0024	LED R data
$ 0026	LED L data
$ 0028	LED E data
$ 1000 ~ $ 17FF	RAM 1
$ 2800 ~ $ 2FFF	RAM 2
$ 3000 ~ $ 37FF	RAM 3
$ 4000 ~ $ 403F	RYP–4
$ 5000 ~ $ 5FFF	Cartridge
$ 8000 ~ $ BFFF	ROM 1
$ C000 ~ $ FFFF	ROM 2

1. RAM1 DATA ($ 1000 ~ $ 17FF)
RAM1 is used for WORK AREA

1. RAM1 DATA ($1000~$17FF)
RAM1はWORK AREAとなっています。



- BACKED UP DATA
  Data which is backed up even after the power is turned off.
  INST MIDI CH
  INST MIDI NOTE
  INST LEVEL
  ACCENT LEVEL
  PAN LEVEL
  INST CHANGE FLAG
  MIDI RECEIVE CH
  EXCLUSIVE CH
  RYP-4 PAN DATA
  INST OUT DATA
- NON-BACKED UP DATA
  Data which is not backed up at after the power is turned off.
  (This data area is cleared when the power is turned on.)
- MIDI TX BUFFER
  MIDI transmit buffer area
- MIDI RX BUFFER
  MIDI receive buffer area
- PATTERN END ADDRESS
  In this area, the Pattern End Addresses in RAM2 are scanned from RAM2 PATTERN Directory and are stored in this memory area.
  (This prevents a delay resulting from consecutive pattern plays)
- START ADDRESS OF CARTRIDGE
  Cartridge buffer area at Save/Load operation

2. RAM2, 3 DATA ($ 2800 ~ $ 37FF)

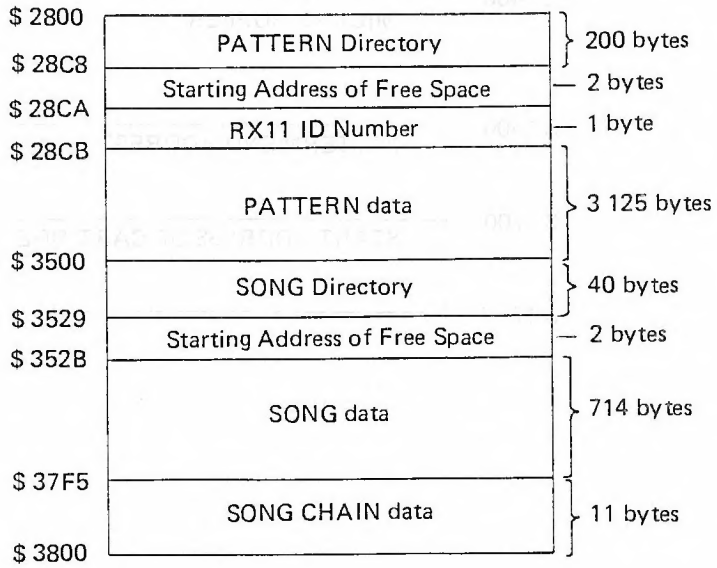
Various data inputted on the front panel are stored in RAM2 and RAM3.
RAM2, 3 ADDRESS MAP is shown in Table 2

- BACKED UP DATA
  POWER OFF時でもBACK UPするDATA
  INST MIDI CH
  〃 NOTE
  INST LEVEL
  ACCENT 〃
  PAN 〃
  INST CHANGE FLAG
  MIDI RECEIVE CH
  EXCLUSIVE CH
  RYP-4 PAN DATA
  INST OUT DATA
- NON-BACKED UP DATA
  POWER OFF時に BACKED UP されない DATA
  (POWER ON時クリアーDATA)
- MIDI TX BUFFER
  MIDI送信バッファーエリア
- MIDI RX BUFFER
  MIDI受信バッファーエリア
- PATTERN END ADDRESS
  RAM2に入っている PATTERN Directory から、そのPATTERNの終わりのアドレスをわり出し、このエリアにメモリーする（PATTERNの連続プレイの遅れをなくす為）
- START ADDRESS OF CARTRIDGE
  カートリッジのセーブ、ロード時のバッファーエリア

2. RAM2,3 DATA ($2800~$37FF)

操作パネル上から打ち込んだ各種のデータは RAM 2, RAM3 にメモリーされます。Table 2 はこのRAM 2,3 のアドレスマップです。

RAM2, 3 ADDRESS MAP



1) Details of Each Address

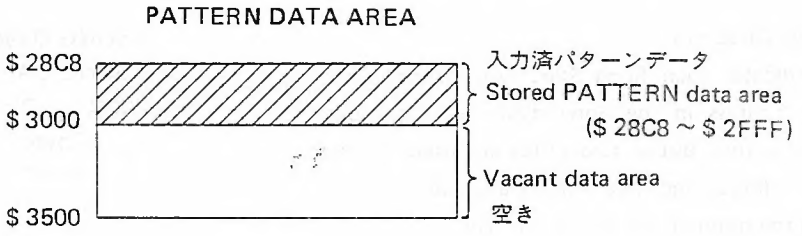
(1) PATTERN (or Song) Directory
In this directory each pattern summary and each pattern start address are stored.

(2) Starting Address of Free Space (PATTERN and SONG)
The starting address of free space is stored in memory (2 bytes of data) so that the MPU of the RX11 know is how much vacant data is left.

1) 各アドレスの内容

①PATTERN (SONG) Directory
各パターンの概要と、各パートのスタート・アドレスがメモリーされている。本でいえば、目次と同じで各パターンの見出しとページが書かれている。

② Starting address of free space
データエリアの空き状態を管理するアドレスで、PATTERN dataあるいはSONG dataエリアの使用されていない先頭アドレスが書かれている。たとえば、PATTERN dataエリアにPATTERNを打ち込んだデータが下図のように入っていればPATTERNのTop address of free spaceのデータは$3000という2byteのデータが入る。



(3) RX11 ID Number
When a cartridge is used, the cartridge must be formatted to the RX11 format. The cartridge ID number for RX11 is $ FE which distinguishes from DX ID NUMBER or RAM cartridge. The RX11 ID NUMBER is stored in memory for formatting and format comparision.

(4) PATTERN (or SONG) Data Area
PATTERN (or SONG) data is stored in this area.

(5) SONG CHAIN Data Area
SONG CHAIN data is stored in this area.

③RX11 ID Number
カートリッジを使用する場合RX11用にフォーマットされたカートリッジかDX用のカートリッジなのかを見わける為のエリア。RX11用のカートリッジはID numberが$FEとなっており、DX用と区別をする。

④PATTERN (SONG) data area
PATTERNあるいはSONGのデータがメモリーされている。

⑤SONG CHAIN data area
SONG CHAINのデータをメモリーします。

2) Data composition

(1) PATTERN Directory
It indicates each Pattern Start Address in PATTERN data area. 2 bytes are used for each pattern and the number of the total bytes is 200. (Number of patterns is 100.)
Each pattern has an address in PATTERN Directory. For example PATTERN 0 0 become $ 2800 and $ 2801 and the address for a pattern number is pre-fixed. (Relative Address)

2) DATAの構成

①PATTERN Directory
PATTERN DATAエリア内の各PATTERNスタートアドレスを示す。1PATTERNにつき2byte使用し、全体で200 byte (PATTERN数は100)使用している。各PATTERNごとに、アドレスをもっており、たとえばPATTERN 00は$2800と$2801となり、PATTERNナンバーに対するアドレスは決まっている。(相対アドレス)

(2) PATTERN DATA Format

Pattern Data Composition varies in the following four kinds of format. In other words, the pattern data format and number of bytes are varied by the number of musical instruments producing sounds at the same time.

②PATTERN DATA Format

データの構造は、以下の4つの状態によって異なります。つまり同時に発音する楽器数により、フォーマットと使用バイト数が違ってきます。

(発音状況) Producing Sounds	(使用バイト数) Number of bytes used
No sound data (Rest data) 無音データ (休符データ)	1
One sound data (1音データ)	2
Two or three sounds data (2～3音データ)	3
Four or more sounds data (4音以上データ)	5

(3) SONG Directory

It indicates each Song Start Address and Song End Address in the Song data area. One song requires four bytes, two bytes are used for the start address and two for its end address. The total the number of bytes is 40 bytes.
(The number of songs is 10)

③SONG Directry

SONG DATAエリア内の各SONGスタートアドレスとエンドアドレスを示す。1 SONGにつき4byte使用し、2byteでスタートアドレス、2byteでエンドアドレスを示す。全体で40 byteとなる(SONG数は10)

(4) SONG Data Format

Song Data Composition varies in the following three kinds of format.

④SONG DATA Format

データ構造は、以下の3種類がある。

	(使用バイト数) Number of bytes used
Pattern number	1
Repeat	3
Tempo change	2

(5) SONG CHAIN Data

In this, one SONG data requires one byte and one SONG CHAIN end data requires one byte. Since the number of SONG data is 10 maximum, the total bytes become 11.

⑤SONG CHAIN DATA

1SONG DATAにつき1byte使用し、SONG CHAIN終了を示すバイトを1 byte必要とする為全バイト数は11 byteとなる。

3. Preset 37 Pattern Data

In RX11, 37 Patterns are preset at factory. The number of total bytes is 1406 and therefore the programmable pattern data area that remains is 3125 bytes—1406 bytes = 1719 bytes.

3. 出荷時のPRESET 37PATTERN DATAについて

RX11では出荷時に37 PATTERNをプリセットしている。このデータの総バイト数は1406byteで、のこりのPATTERN DATA areaは

3125byte−1406byte＝1719byte

となる。

NUMBER OF BYTES USED FOR EACH PRESET PATTERN　各プリセットパターンの必要byte数

PTN NO.	Number of bytes	PTN NO.	Number of bytes	PTN NO.	Number of bytes	PTN NO.	Number of bytes
00	38	10	33	20	23	30	41
01	39	11	39	21	46	31	41
02	77	12	38	22	17	32	36
03	81	13	37	23	33	33	45
04	40	14	37	24	25	34	39
05	37	15	41	25	21	35	32
06	38	16	42	26	68	36	35
07	33	17	41	27	29		
08	43	18	21	28	30		
09	26	19	23	29	41		

RX11 MIDI Implementation Chart

Date : 7/20, 1984

Model RX11 MIDI Implementation Chart Version : 1.0

Function ...	Transmitted	Recognized	Remarks
Basic Default	1 - 16 *	1 - 16 *	* memorized
Basic Changed	1 - 16 *	1 - 16 *	
Mode Default	3	1,3 *	
Mode Messages	x	x	
Mode Altered	**********	x	
Note Number	36 - 99	36 - 99	
Note Number : True voice	**********	x	
Velocity Note ON	o 9nH,v=1-127	o v=1-127	
Velocity Note OFF	x 9nH,v=0	x	
After Touch Key's	x	x	
After Touch Ch's	x	x	
Pitch Bender	x	x	
Control Change 6	o	x	Data entry knob
Prog Change	x	x	
Prog Change : True #	**********	x	
System Exclusive	o	o	Pattern,Song
System Common : Song Pos	x	x	
System Common : Song Sel	o 0 - 9	o 0 - 9	
System Common : Tune	x	x	
System Real Time : Clock	o **	o (MIDI mode)	
System Real Time : Commands	o	o	
Aux : Local ON/OFF	x	x	
Aux : All Notes OFF	x	x	
Mes- sages: Active Sense	x	x	
Mes- sages: Reset	x	x	
Notes	** during playback of a song or pattern		

Mode 1 : OMNI ON, POLY Mode 2 : OMNI ON, MONO o : Yes
Mode 3 : OMNI OFF, POLY Mode 4 : OMNI OFF, MONO x : No

RX11 MIDI DATA FORMAT

1. TRANSMISSION DATA

1–1. Channel Voice Messages

- 1 0 0 1 n n n n Note ON & channel number. n's are defined by "TRNS CH" of each instrument which was set up when in the MIDI OUT function mode.
- 0 k k k k k k k Key number (K=36: C1 ~ K = 99: D#6)
  k's are defined by "NOTE =" of each instrument which was set up when in the MIDI IN function mode.
- 0 v v v v v v v Key velocity (v = 0: OFF, v = 1: INST LEVEL 0 ~ v = 125: INST LEVEL 31)

1) This message is transmitted at CH INFO AVAIL mode when in the MIDI OUT function mode.

2) Key ON/OFF data is always has a pair (Key and Velocity) and transmitted as a unit of 5 bytes.

1 0 0 1 n n n n	Status
0 k k k k k k k	Key ON
0 v v v v v v v	
0 k k k k k k k	Key OFF
0 0 0 0 0 0 0 0	

3) When RX11 produces sound, the message are always transmitted except the following cases:
i) When in the CASSETTE function mode.
ii) When in the CARTRIDGE function mode.

- 1 0 1 1 n n n n Control change & channel number. n's are defined by "SYS EXCL CH" which was set up when in the MIDI OUT function mode.
- 0 c c c c c c c Control number (c = 6: Data entry knob)
- 0 d d d d d d d Data (d = 0 ~ 127)

1) This message is transmitted when CH INFO AVAIL is displayed (MIDI OUT function mode) but is not transmitted while the parameter change data is being transmitted.

2) This message is transmitted when in the "SELECT PTN", "SELECT SONG," "PLAY PTN" or "PLAY SONG" mode.

1–2. System Common Message

- 1 1 1 1 0 0 1 1 Song select
- 0 s s s s s s s Song number (S = 0 ~ 9)

1) This message is transmitted when the RX11 song number is input by the numbered keys.

1–3. System Real Time Messages

- 1 1 1 1 1 0 0 0 Timing clock
  This message (Timing clock pulses) is transmitted when the SYNC is set for "INTERNAL CLOCK" operation.
  Timing clock pulses are transmitted in the rate of 24 clock pulses a quarter note.
- 1 1 1 1 1 0 1 0 Start
  This message is transmitted at the time of PLAY/START operation of PATTERN, SONG or CHAIN.
- 1 1 1 1 1 0 1 1 Continue
  This message is transmitted at the time of PLAY CONTINUE operation of PATTERN, SONG or CHAIN.

1. TRANSMISSION DATA

1－1. Channel Voice Messages

●1001nnnn Note ON & Channel number
n は MIDI OUT 機能で設定した，各楽器の"TRNS CH"に従う。

●0kkkkkkk key number (K＝36:C1～K＝99:D＃6)
MIDI IN 機能で設定した各楽器の"NOTE＝"に従う。

●0vvvvvvv key velocity (V＝0:OFF, V＝1:INST LEVEL 0～V＝125:INST LEVEL 31)

1) MIDI OUT機能のCH INFO AVAILの時、送信。

2) キーオン・キーオフは常に対で、5バイト単位で送信する。

1001nnnn 0kkkkkkk 0yyyyyyy 0kkkkkkk 00000000
Status └key ON──┘ └key OFF ──┘

3) RX11本体が発音する時は，以下の場合を除いて常に送出。
i) カセット機能の時
ii) カートリッジ機能の時

●1011nnnn Control change & channel number
n は MIDI OUT 機能で設定した "SYS EXCL CH"に従う。

●0ccccccc Control number (C＝6:Data entry knob)

●0ddddddd Data (d＝0～127)

1) MIDI OUT機能のCH INFO AVAILの時，送信。
但し，パラメータチェンジ送信時は送信しない。

2) 送信する MODE は "SELECT PTN", "SELECT SONG", "PLAY PTN", "PLAY SONG"

1－2. System Common Message

●11110011 Song Select

●0sssssss Song number (S＝0～9)

1) 数字キーで本体のソングナンバーを入力する時に送信。

1－3. System Real Time Messages

●11111000 Timing clock
SYNC機能が"INTERNAL CLOCK"で，プレイ中のみ送信。
4分音符当り24個の割合で送信。

●11111010 Start
PATTERN, SONG, CHAIN のプレイ，スタート時に送信。

●11111011 Continue
PATTERN, SONG, CHAINのプレイ・コンティニュー時に送信。

- 11111100 Stop
  This message is transmitted at the time of PLAY/STOP operation of PATTERN, SONG or CHAIN.

1–4. System Exclusive Messages

1–4–1. Bulk Dump of PATTERN, SONG and CHAIN DATA

- 11110000 Status byte
- 0iiiiiii Identification number (i = 67: YAMAHA)
- 0sssnnnn Sub status (s = 0) & Channel number. n's are defined by "SYS EXCL CH" which was set up when in the MIDI OUT function mode.
- 0fffffff Format number (f = 127)
- 0bbbbbbb Byte count MS byte [b = 8192 + 10 (the number of bytes of a header)]
- 0bbbbbbb Byte count LS byte

(header)

01001100	ASCII classification (4 bytes)
01001101	
00100000	LM ␣␣
00100000	
00111000	ASCII model name (6 bytes)
00110100	
00110110	
00110100	8464 ␣␣
00100000	
00100000	

- 0ddddddd Data 1st byte
  ⋮
  0ddddddd Data 8192nd byte
  (The upper 4 bits and lower 4 bits are converted to ASCII and is transmitted by 2 bytes of data.)
- 0ccccccc Check sum (This figure is obtained by taking the 2's complement of the sum of 8192 bytes data and 10 bytes of a header.)
- 11110111 EOX

1) After selecting "SYS EXCL AVAIL" when in the MIDI OUT function mode and depressing the MIDI OUT key again, "MIDI TRANSMIT ?" is them displayed. At this moment, when YES button is depressed, the display turns off for about 3 seconds and the bulk data is dumped.

2) This message is transmitted by receiving a DUMP REQUEST such as F0(H), 43(H), 2n(H), 7E(H) and F7(H), when in the "SELECT PTN" or "SELECT SONG" operation of the SYS EXCL AVAIL mode.

1–4–2. Parameter Bulk Dump

- 11110000 Status byte
- 0iiiiiii Identification number (i = 67: YAMAHA)

- 11111100 STOP
  PATTERN, SONG, CHAINのプレイ・ストップ時に送信。

1－4. System Exclusive Messages

1－4－1. PATTERN, SONG, CHAIN DATAのバルクダンプ

- 11110000 Status byte
- 0iiiiiii Identification number (i=67 : YAMAHA)
- 0sssnnnn Sub status (S=0) & channel number
  nはMIDI OUT機能で設定した"SYS EXCL CH"に従う。
- 0fffffff Format number (f=~~127~~ 126)
- 0bbbbbbb Byte count MS byte
  0bbbbbbb Byte count LS byte
  (b=8192+10 (headerのbyte数))

(header)

01001100	ASCII classification (4byte)
01001101	
00100000	LM␣␣
00100000	
00111000	ASCII model name (6byte)
00110100	
00110110	
00110100	8464␣␣
00100000	
00100000	

- 0ddddddd Data 1st byte
  ⋮
  0ddddddd Data 8192nd byte
  (上位4bitと下位4bitをASCIIに変換して2byteで送る)
- 0ccccccc Check sum (8192 byte のデータと10 byte のHeaderを加算し、2の補数をとったもの)
- 11110111 EOX

1) MIDI OUT機能で"SYS EXCL AVAIL"とし、再度MIDI OUTキーを押すと"MIDI TRANSMIT?"と表示する。この時 YES キーを押すと約3秒間ディスプレイが消え、バルクデータがダンプされる。

2) "SYS EXCL AVAIL"でSELECT PTN, SELECT SONGの時, ダンプリクエスト(F0(H), 43(H), 2n(H), 7E(H), F7(H))を受けると送信する。

1－4－2. Parameter のバルクダンプ

- 11110000 Status byte
- 0iiiiiii Identification number (i=67 : YAMAHA)

- 0sssnnnn Sub status (s = 0) & Channel number. n's are defined by "SYS EXCL CH" which was set up when in the MIDI OUT function.
- 0fffffff Format number (f = 11)
- 0bbbbbbb Byte count MS byte (b = 178 + 10)

0bbbbbbb Byte count LS byte

01001100
01001101 } ASCII classification LM ␣ ␣ (4 bytes)
00100000
00100000

00111000
00110100
00110110 } ASCII model name 8464 ␣ ␣ (6 bytes)
00110100
00100000
00100000

} (header)

- 0ddddddd Data 1st byte
  ⎩
  0ddddddd Data 178th byte

} The upper 4 bits and lower 4 bits are converted to ASCII and is transmitted by 2 bytes of data.

- 0ccccccc Check sum (This figure is obtained by taking the 2's complement after adding 178 bytes data and 10 bytes of a header.)
- 11110111 EOX

1) This message is transmitted by receiving DUMP REQUEST such as F0(H), 43(H), 2n(H), 0B(H) and F7(H) at "SELECT PTN" or "SELECT SONG" operation when in the SYS EXCL AVAIL mode.

1–4–3. Parameter Change

- 11110000 Status byte
- 0iiiiiii Identification number (i = 67 YAMAHA)
- 0sssnnnn Sub status (s = 1) & Channel number n's are defined by "SYS EXCL CH" which was set up in the MIDI OUT function mode.
- 0ggggghh Parameter group number (g = 0)
  Parameter sub group number (h = 3)
- 0ppppppp Parameter number
- 0ddddddd Data
- 11111111 EOX

1) This message is transmitted when each parameter is changed when in the "SYS EXCL AVAIL" mode.

- 0sssnnnn Sub status (S=0) & channel number nはMIDI OUT機能で設定した"SYS EXCL CH"に従う。
- 0fffffff Format number (f=11)

0bbbbbbb Byte count MS byte (b=178+10)

0bbbbbbb Byte count LS byte

01001100
01001101 } ASCII classification (4byte) LM ␣ ␣
00100000
00100000

00111000
00110100
00110110 } ASCII model name (6byte) 8464 ␣ ␣
00110100
00100000
00100000

} (header)

- 0ddddddd Data 1st byte
  ⎩
  0ddddddd Data 178th byte

} (上位 4bit と下位 4bit を ASCIIに変換して,2 byte で送る)

- 0ccccccc Check sum (178 byteのデータと10 byteのheaderを加算して, 2の補数をとったもの)
- 11110111 EOX

1) "SYS EXCL AVAIL"でSELECT PTN, SELECT SONGの時, ダンプリクエスト(F0(H), 43(H), 2n(H), 0B(H), F7(H))を受けると送信する。

1−4−3. Parameter Change

- 11110000 Status byte
- 0iiiiiii Identification number (i=67: YAMAHA)
- 0sssnnnn Sub status (S=1) & channel number nはMIDI OUT機能で設定した"SYS EXCL CH"に従う。
- 0ggggghh Parameter group number (g=0)
  Parameter Sub group number (h=3)
- 0ppppppp Parameter number
- 0ddddddd Data
- 11110111 EOX

1) "SYS EXCL AVAIL"の時それぞれのパラメータを動かすと送信する。

	Parameter No.	Parameter	DATA	DISPLAY
*	0～15	MIDI CHANNEL	0～15	1～16
*	16～31	MIDI NOTE	36～99	36～99
*	32～47	INST LEVEL	0～31	0～31
*	48～63	ACCENT LEVEL	0～31	0～31
*	64～79	PAN	1～15	L=15 R=1 〈 L=1 R=15
**	115	TOTAL VOLUME	0～63	—
	116 117	INST CHANGE SD1 INST CHANGE SD2	0 1 2 3 4 5 6 7	HEAVY MEDIUM LIGHT HI TURN1 HI TUNE2 HI TUNE3 HI TUNE4 HI TUNE5
	118 119	INST CHANGE BD1 INST CHANGE BD2	0 1 2	MEDIUM1 MEDIUM2 HEAVY
	120	INST CHANGE HH CLOSED	0 1 2	CLOSED1 CLOSED2 PEDAL
	121	INST CHANGE HH OPEN	0 1	HH OPEN1 HH OPEN2
	122	INST CHANGE COWBELL	0 1	COWBELL1 COWBELL2
	123	INST CHANGE RIMSHOT	0 1	RIMSHOT1 RIMSHOT2
	124	INST CHANGE CLAPS	0 1	CLAPS1 CLAPS2
**	125	CHANGE SYS EXCL UNAVAIL TO AVAIL	0	—
**	126	BREAK	0	—
**	127	METRONOME	***0～63	—

NOTE: *Each musical instrument has its number as shown below.

SD1	sm0	SD2	sm8	m: 0-MIDI CHANNEL
TOM1	sm1	TOM3	sm9	1-MIDI NOTE
TOM2	sm2	TOM4	smA	2-INST LEVEL
BD1	sm3	BD2	smB	3-ACCENT LEVEL
HH OPEN	sm4	HH CLOSED	smC	4-PAN
RIDE	sm5	CRASH	smD	
COWBELL	sm6	RIMSHOT	smE	
SHAKER	sm7	CLAPS	smF	

**Each parameter specilizes in reception only.

***OOA$\ell\ell\ell\ell\ell$ A=0 ; 1 Wave (without accent)
A=1 ; 3 Wave (with accent)
ℓ : 0 ~ 31 (Volume)

注) *各楽器は以下のナンバーとする。

SD1	sm0	SD2	smB	m:0-MIDI CHANNEL
TOM1	sm1	TOM3	sm9	1-MIDI NOTE
TOM2	sm2	TOM4	smA	2-INST LEVEL
BD1	sm3	BD2	smB	3-ACCENT LEVEL
HH OPEN	sm4	HH CLOSED	smC	4-PAN
RIDE	sm5	CRASH	smD	
COWBELL	sm6	RIMSHOT	smE	
SHAKER	sm7	CLAPS	smF	

**受信のみとする。

***OOA$\ell\ell\ell\ell\ell$ A=0 ; 1波（アクセントナシ）
A=1 ; 3波（アクセントアリ）
ℓ : 0～31 （音量）

2. RECEPTION DATA

2–1. Channel Voice Message

- 1 0 0 1 n n n n Note on & Channel number
- 0 k k k k k k k Key number (k = 36: C1 ～ k = 99 D#6)
- 0 v v v v v v v Key velocity (v = 0: OFF v = 1 ～ 129: ON)

1) This message is received only at "CH INFO AVAIL" mode at MIDI IN function.
2) It is received at OMNI ON regardless of Channel "n".
   It is received at OMNI OFF only when it matches with the RECEIVE CH. However it is not received during CASSETTE or CARTRIDGE operation.
3) Key number data is received only when it matches each instrument's NOTE. When plural instruments match with the key number data, all instruments produce sounds.
4) Key velocity data is transformed in the following manner in RX11 and is volume-set in each channel.
   (Key velocity x INST LEVEL + 16)/64
   However the key velocity always becomes 31, when the above figure exceeds 31.
5) All key OFF data is ignored. When Key OFF data is received during sound producing, but they are not dumped along the way.

2–2. System Common Message

- 1 1 1 1 0 0 1 1 Song Select
- 0 s s s s s s s Song number (s = 0 ～ 9)

1) This message is received only at "SELECT SONG" operation.
2) Only SONG number (0 ～ 9) data is received and the rests are ignored.

2–3. System Real Time Messages

- 1 1 1 1 1 0 0 0 Timing clock

1) This message is received only when RX11 clock source is MIDI (which was set up with SYNC function) and when PATTERN, SONG or CHAIN is playing.

- 1 1 1 1 1 0 1 0 Start
- 1 1 1 1 1 0 1 1 Continue
- 1 1 1 1 1 1 0 0 Stop

2–4. System Exclusive Messages

2–4–1. Bulk Dump of PATTERN SONG and CHAIN DATA

This data format is the same as of the transmission data. Only the data which matches with the SYS EXCL CH are received when in the SYS EXCL AVAIL mode.

2. RECEPTION DATA

2－1. Channel Voice Message

- 1001nnnn Note on & channel number
- 0kkkkkkk Key number (K＝36:C1～K＝99:D＃6)
- 0vvvvvvv Key velocity (V＝0:OFF　V＝1～127:ON)

1) MIDI IN機能で"CH INFO AVAIL"の時のみ受信。
2) OMNI ON の時はチャンネル n に関係なく受信。
   OMNI OFFの時はRECEIVE CHに一致したもののみ受信。ただし，カセット，カートリッジ機能中は受信しない。
3) キーナンバーは各楽器の NOTE に一致したもののみ受信。複数の楽器が一致した場合はすべて発音する。
4) キーベロシティーはRX11で以下の変換をして各チャンネルにボリュームセット。
   (Key Velocity × INST LEVEL＋16)/64
   ただし31を越えるものについては31とする。
5) キーオフについてはすべて無視。発音中にキーオフを受信しても途中でダンプをかけたりしない。

2－2. System Common Message

11110011　Song Select

0sssssss　Song number (S＝0～9)

1) SELECT SONG 機能中のみ受信。
2) SONG numberは0～9のみ受信，その他は無視する。

2－3. System Real Time Messages

- 11111000　Timing clock

1) RX11のクロックソースがMIDI (SYNC機能で設定)で，PATTERN, SONG, CHAINをプレイ中のみ受信。

- 11111010　Start
- 11111011　Continue
- 11111100　STOP

2－4. System Exclusive Messages

2－4－1. PATTERN, SONG, CHAIN DATAのバルクダンプ

データのフォーマットは送信データと同じ。SYS EXCL AVAILのとき，SYS EXCL CHと一致したデータのみ受信する。RX11本体は，SELECT PTN, SELECT SONGのどちらかのモードの時受信。正常にデータを受信した場合は表示上何も変わらない。

RX11 receives this message either when in the "SELECT PTN" or "SELECT SONG" mode. If the data is received normally, the display remains unchanged.
But if the check sum proves any discrepancy, "MIDI DATA ERROR" is displayed. However, it should be noted that the data is taken in even if the check sum error data or the data designating the number of bytes is not transmitted. (The display will still remain unchanged.)

2–4–2. Parameter Bulk Dump

This data format is the same as of the transmission data. Only the data which matches with the SYS EXCL CH are received when in the SYS EXCL AVAIL mode. This data is received when "SELECT PTN" or "SELECT SONG" is displayed. When this data is received normally, the display remains unchanged. But if the check sum proves any descrepancy, "MIDI DATA ERROR" is displayed. However, it should be noted that the data is taken in even if the check sum error data or the data designating the number of bytes is not transmitted. (The display will still remain unchanged.)

2–4–3. Parameter Change

This data format is the same as of the transmission data. Only the data which matches with the SYS EXCL CH is received. This data, except the data with Parameter number 125, is received when in the SYS EXCL AVAIL mode. Parameter number 125 data is always received except at CASSETTE or CARTRIDGE function. And Parameter number 126 data is always received except at CASSETTE, CARTRIDGE "EDIT" operation. Any other parameter data is received when in the "SELECT PTN", "SELECT SONG", "PLAY PTN" "PLAY SONG" or " CHAIN" mode.

2–4–4. Dump Request

- 1 1 1 1 0 0 0 0 Status byte
- 0 i i i i i i i Identification number (i = 67)
- 0 s s s n n n n Sub status (s = 2) & Channel number. n's are defined by "SYS EXCL CH" which was set up in the MIDI OUT function mode.
- 0 f f f f f f f Format number.
  f = 126 : PATTERN/SONG Dump Request
  f = 11 : Parameter Dump Request

Only the data which matches with the SYS EXCL CH are received when in the SYS EXCL AVAIL mode. This data is received only when in the "SELECT PTN" or "SELECT SONG" mode.

チェックサムが一致しなかった場合は "MIDI DATA ERROR!" を表示する。ただし，チェックサムエラーや，指定されたバイト数データが送られてこなかった場合（表示変化ナシ）でも，データは取り込んでしまうので注意が必要。

2−4−2. Parameterのバルクダンプ

データフォーマットは送信データと同じ。
SYS EXCL AVAILのとき，SYS EXCL CHと一致したデータのみ受信。SELECT PTN, SELECT SONG表示時に受信。正常にデータを受信した場合は，表示上何も変わらない。チェックサムが一致しなかった場合は "MIDI DATA ERROR!" を表示する。ただし，チェックサムエラーや，指定されたバイト数データが送られてこなかった場合(表示は変化ナシ)でもデータは取り込んでしまうので注意が必要。

2−4−3. Parameter change

データのフォーマットは，送信データと同じ。SYS EXCL CHと一致したデータのみ受信。パラメータナンバー 125 以外は SYS EXCL AVAIL のとき受信。パラメータナンバー 125 は SYS EXCL UNAVAIL の時受信。パラメータナンバー 125 はカセット，カートリッジ機能中以外は常に受信。またパラメータナンバー 126 はカセット，カートリッジ，エディット機能中以外常に受信。その他のパラメータは，SELECT PTN, SELECT SONG, PLAY PTN, PLAY SONG と CHAIN の時受信。

2−4−4. Dump Request

- 11110000 Status byte
- 0iiiiiii Identification number (i=67 : YAMAHA)
- 0sssnnnn Sub status (S=2) & channel number
  nはMIDI OUT機能で設定した"SYS EXCL CH"に従う。
- 0fffffff Format number (f=126 PATTERN, SONG のダンプリクエスト， f=11 Parameter のダンプリクエスト)

SYS EXCL AVAILのとき，SYS EXCL CHと一致したデータのみ受信。SELECT PTN, SELECT SONG のモードの時のみ受信。

■LSI DATA TABLES(LSI端子機能表)

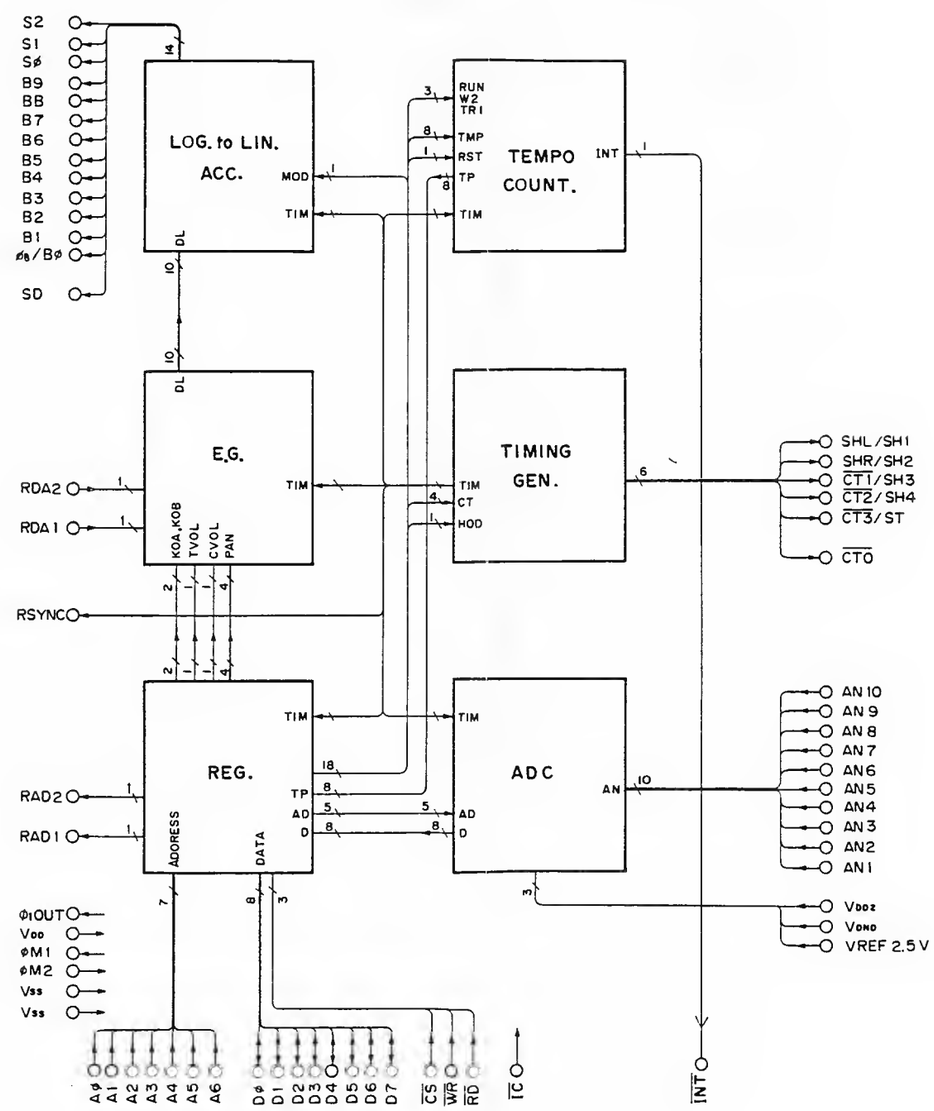
YM 3010 DAC (2-Channel parallel input floating D/A converter)

PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	VDD	I	DC supply	13	SPI	I	Analog switch control input for S/H
2	D6	I	}	14	SPO	I	
3	D7	I	} Digital data in (Mantissa)	15	ST	I	Strobe
4	D8	I		16	S2	I	} Digital data in (Exponent)
5	D9	I	}	17	S1	I	
6	RB	O	Reference bias 1/2 VDD	18	S0	I	
7	MP	I	Middle point bias 1/2 VDD	19	D0	I	}
8	TOBUFF	O	Analog output to Buffer AMP.	20	D1	I	
9	COM	I	CHO and CHI analog switch input for S/H	21	D2	I	} Digital data in (Mantissa)
10	CHO	O	}	22	D3	I	
11	CHI	O	} Anolog switch output for S/H	23	D4	I	
12	GND	I	Ground	24	D5	I	}

YM2154 RYP-4

PIN NO.	NAME	I/O	FUNCTION	PIN NO.	NAME	I/O	FUNCTION
1	V_{SS}	I	Digital ground	34	$\overline{CT_1}$/ SH_3	O	CT_1/LED control SH_3/Sample and hold
2	$\overline{INT}$	O	Interrupt request	35	SHR/ SH_2	O	SHR/Sample and hold SH_2/ "
3	S_2	O	}	36	SHL/ SH_1	O	SHL/ " SH_1/ "
4	S_1	O	} Exponent Output to DAC	37	$\overline{CTO}$	O	LED control
5	S_0	O	}	38	$\overline{RD}$	I	Read Enable
6	B_9	O	}	39	$\overline{WR}$	I	Write Enable
7	B_8	O	}	40	$\overline{CS}$	I	Chip select
8	B_7	O	}	41	A_0	I	}
9	B_6	O	}	42	A_1	I	}
10	B_5	O	} Mantissa Output to DAC	43	A_2	I	} Address bus
11	B_4	O	}	44	A_3	I	}
12	B_3	O	}	45	A_4	I	}
13	B_2	O	}	46	A_5	I	}
14	B_1	O	}	47	A_6	I	}
15	φB/B0	O	φB/Clock for DAC B0/Mantissa (LSB)	48	D_0	I/O	}
16	SD	O	Serial data output	49	D_1	I/O	}
17	V_{SS}	I	Digital ground	50	D_2	I/O	}
18	VREF	I	Reference voltage for ADC	51	D_3	I/O	} Data bus
19	VDD2	I	Analog DC supply	52	D_4	I/O	}
20	VGND	I	Analog ground	53	D_5	I/O	}
21	AN_1	I	}	54	D_6	I/O	}
22	AN_2	I	}	55	D_7	I/O	}
23	AN_3	I	}	56	RDA2	I	ROM data 2 (ch7 ~ 12)
24	AN_4	I	}	57	RDA1	I	" 1 (ch1 ~ 6)
25	AN_5	I	} Analog data in	58	RSYNC	O	ROM data syncro pulse
26	AN_6	I	}	59	RAD2	O	ROM address 2 (ch7 ~ 12)
27	AN_7	I	}	60	RAD1	O	" 1 (ch1 ~ 6)
28	AN_8	I	}	61	VDD	I	Digital DC supply (+5V)
29	AN_9	I	}	62	ϕ_1 OUT	O	ROM CLOCK
30	AN_{10}	I	}	63	ϕM_2	I	Master clock pulse
31	$\overline{IC}$	I	Initial clear	64	ϕM_1	O	"
32	$\overline{CT_3}$/ ST	O	CT_3/LED control ST/Strobe DAC data				
33	$\overline{CT_2}$/ SH_4	O	CT_2/ " SH_4/Sample and hold				

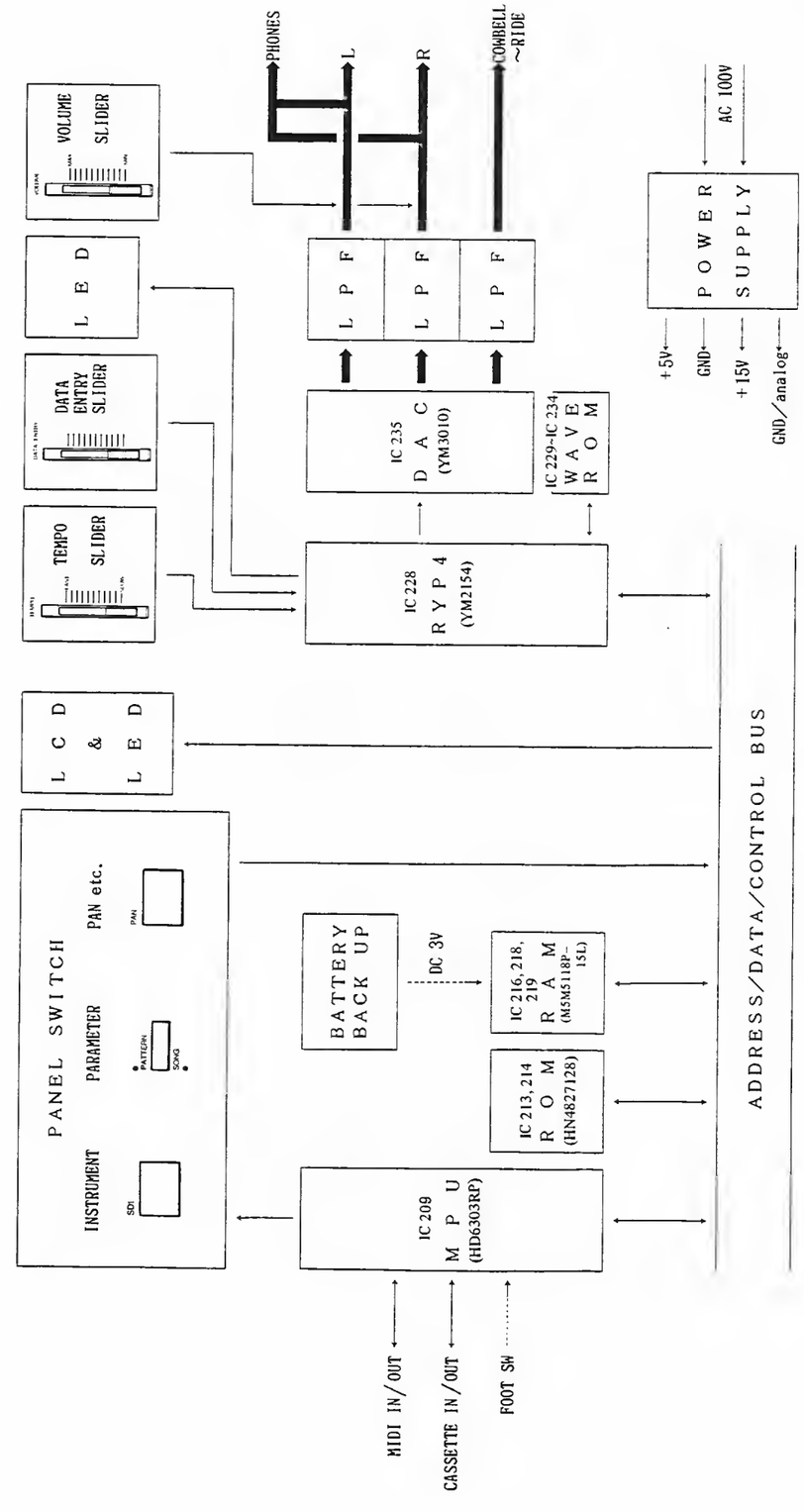
● YM2154 BLOCK DIAGRAM



WAVE ROM SOUND SOURCE

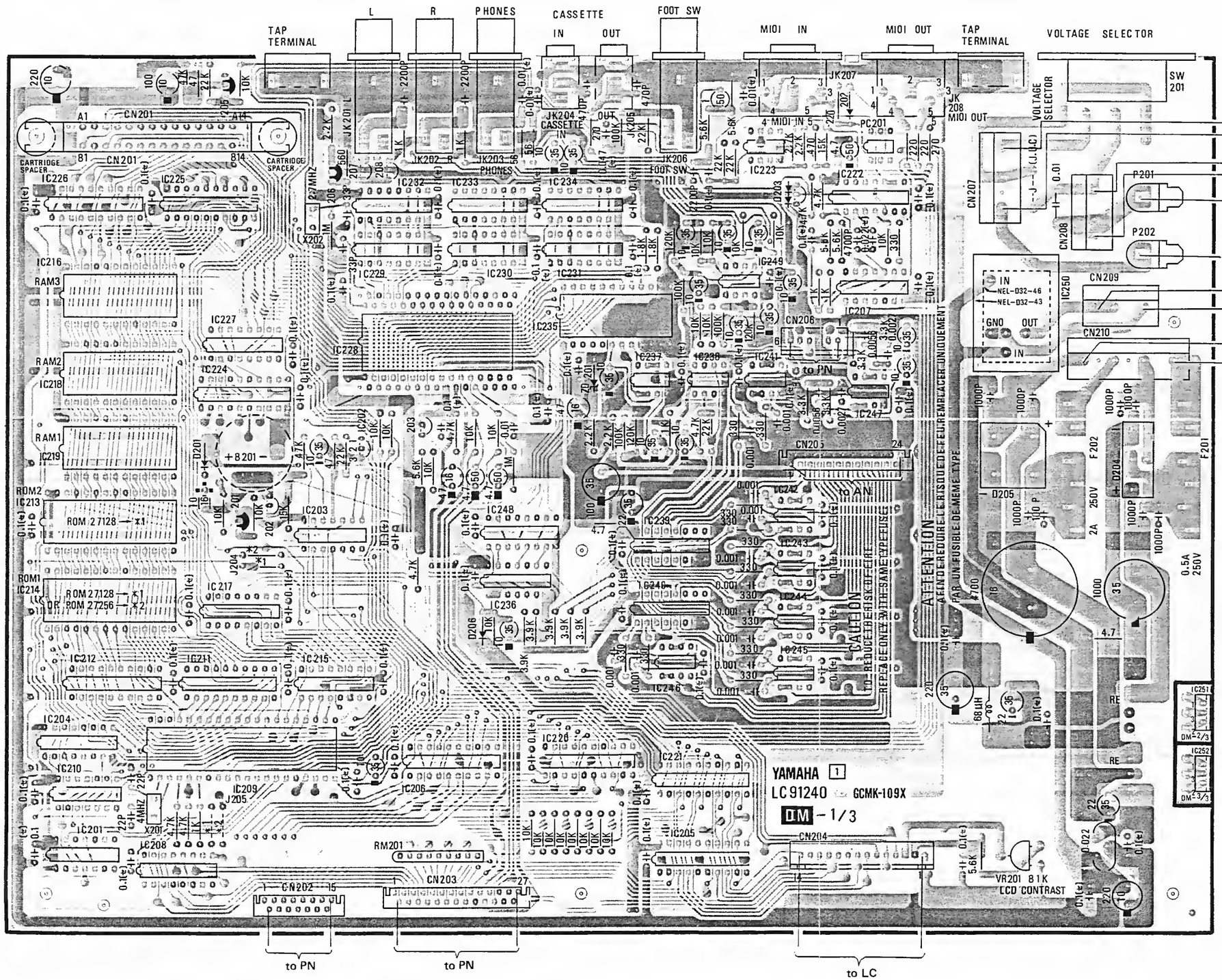
WAVE ROM NO.	SOUND SOURCE	MEMORY CAR (BYTES)	
YM 21901	RIDE	32K	same RX-15
YM 21902	CRASH	32K	
YM 21903	HH OPEN 1	20K	
	PEDAL	2K	
	CLOSED 1	3K	
	CLAPS 1	3K	
	COWBELL 1	3K	
	TEST	1K	
YM 21907	BD (M1)	2K	
	SD (M)	4K	
	SD (HT1)	4K	
	RIMSHOT 1	2K	
	SHAKER	2K	
	TOM 1	6K	
	TOM 2	6K	
	TOM 3	6K	
YM 21906	HH OPEN 2	22K	
	CLOSED 2	3K	
	CLAPS 2	3K	
	COWBELL 2	3K	
	NOT USED	1K	
YM 21905	TOM 4	6K	
	BD (M2)	3K	
	BD (HV)	2K	
	SD (L)	3K	
	SD (HV)	5K	
	SD (HT2)	3K	
	SD (HT3)	3K	
	SD (HT4)	3K	
	SD (HT5)	3K	
	RIMSHOT 2	1K	
	TEST	1K	

BLOCK DIAGRAM



CIRCUIT BOARDS

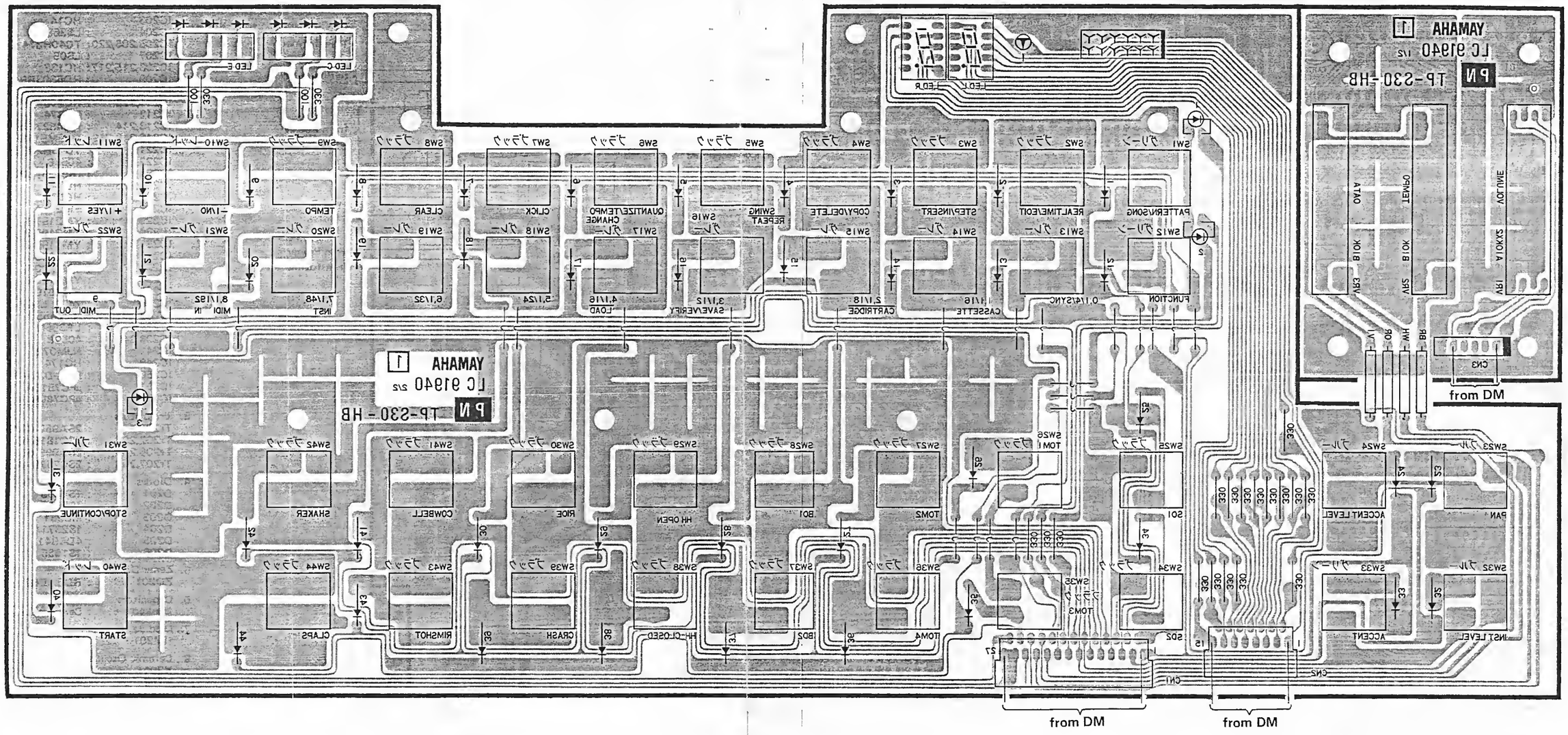
● DM Circuit Board



1. Circuit Board : LC91240
2. IC's
   - IC201 : HC74
   - IC202 : PST518
   - IC203 : HC14
   - IC204 : LS368
   - IC205,206,220: TC40H374
   - IC207 : LS05
   - IC208,215,217: HC138
   - IC209 : HD6303RP
   - IC210 : HC32
   - IC211,225 : HC245
   - IC212 : HC374
   - IC213,214 : HN4827128
   - IC216,218,219: *M5M5118P-15L
   - IC221 : TC40H240
   - IC222 : 40538
   - IC223 : IR9311, μPC311C
   - IC224,226 : HC244
   - IC227 : HC139
   - IC228 : YM2154
   - IC229 : YM2190-1
   - IC230 : YM2190-2
   - IC231 : YM2190-3
   - IC232 : YM2190-7
   - IC233 : YM2190-5
   - IC234 : YM2190-6
   - IC235 : YM3010
   - IC236 : 7407, LS07
   - IC237,247,249: NJM4556
   - IC238 : LF356N
   - IC239,240 : 40518
   - IC241 ~ 246 : NJM072
   - IC248 : HC174
   - IC250 : NEL-D32-43
   - IC251 : μPC7815A
   - IC252 : μPC7805
3. Transistors
   - Tr201 : 2SA950 (O.Y), 2SA881 (Q)
   - Tr202,203 : 2SC1815 (O.Y)
   - Tr205,206 : 2SA999 (E.F)
   - Tr207,208 : 2SC2878 (A.B)
4. Diodes
   - D201 : 1S1555
   - D202 : 1S1555
   - D203 : MC931
   - D204 : 1S2371A
   - D205 : 4D4841
   - D206 : 1S1555
5. Zener Diode
   - ZD201 : RD5.1EB2
6. Capacitors
   - Marked (±) : Ceramic Capacitor
7. Module Resistor
   - RM201 : 4.7k x 8
8. Ceramic Oscillators
   - X201 : 4MHz
   - X202 : 2.7MHz
9. Fuse

Model	NA Number	F 201	F202
Japanese	NA 81362	0.5A 250V	2A 250V
Canadian U.S.American	NA 81363	ST-4 0.5A 250V	ST-4 2A 250V
North European	NA 81364	T500mA 250V	T2A 250V

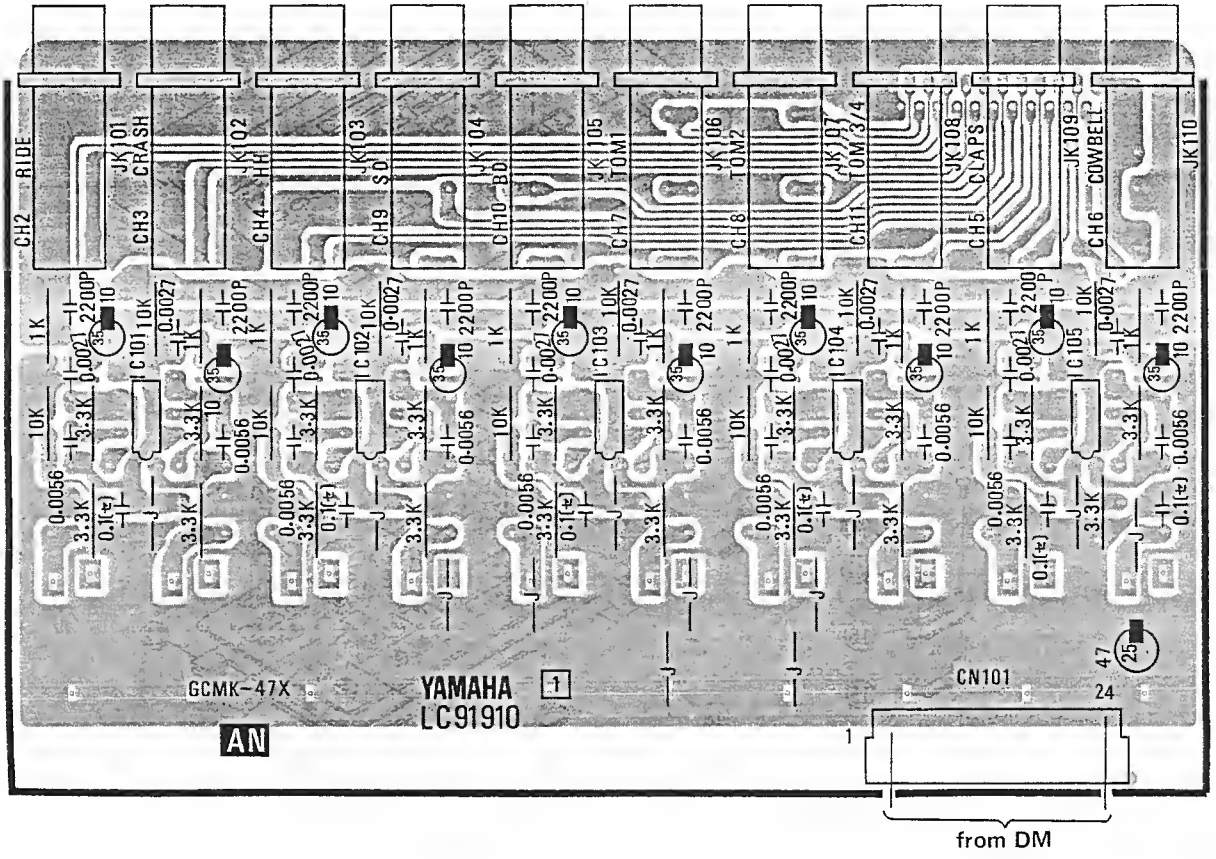
● PN Circuit Board



● View from the printed pattern side of the circuit board.
この基板はパターン面から見たものです。

1. Circuit Board : LC91940
2. Diodes
   D1 ~ 44 : 1S1555
3. LED's
   LED 1 ~ 3 : SLP144B-40
   LED L, R : GL-9R03D
   LED C, E : LD-701VR

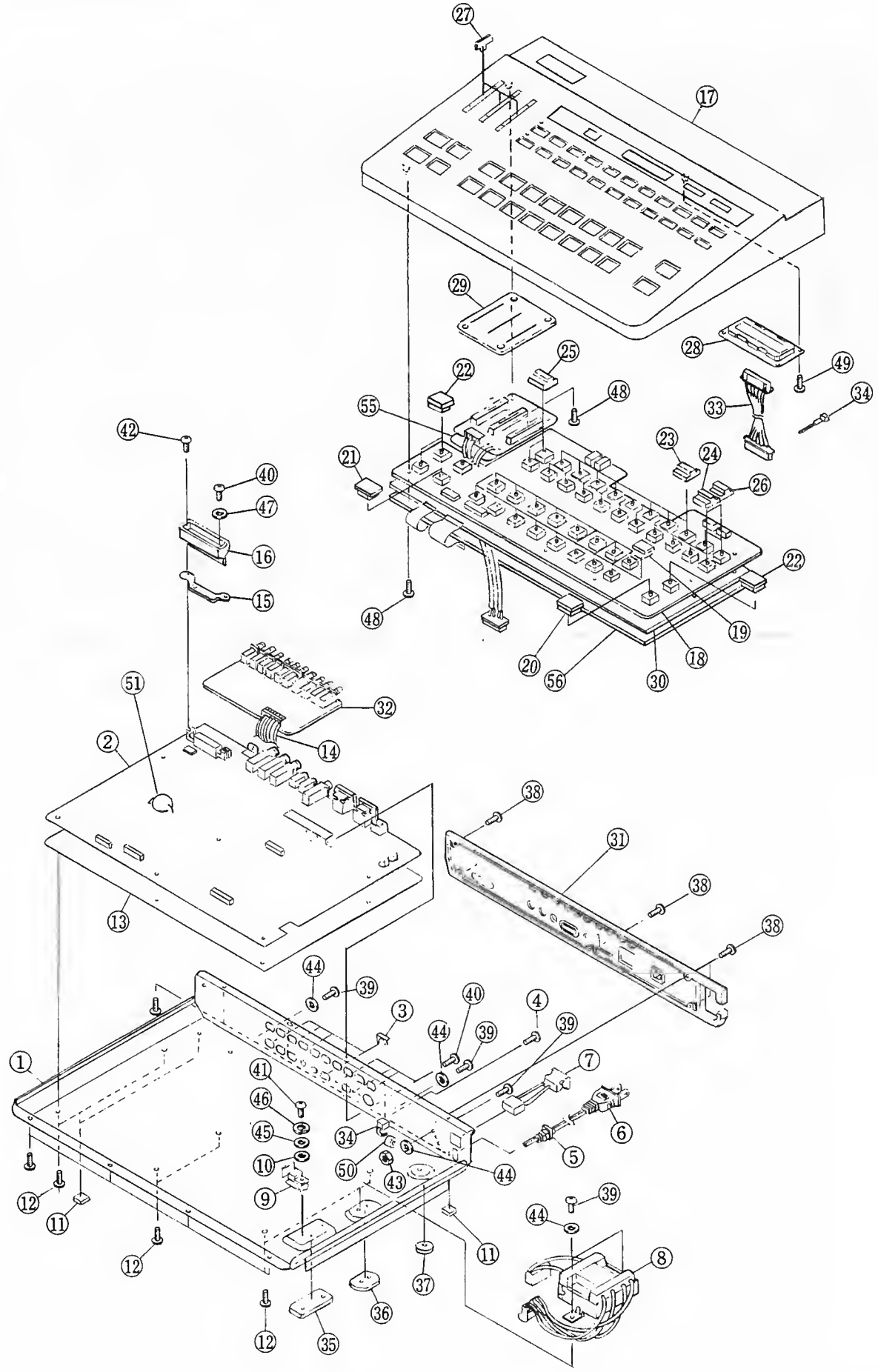
● AN Circuit Board



1. Circuit Board : LC91910
2. IC's
   IC101 ~ 105 : NJM4558DV
3. Capacitors
   Marked (±) : Ceramic Capacitors

PARTS LIST

■EXPLODED VIEW(分解図)



Ref. No.	Part No.	Description		品名	Remarks	ランク
1	AA 830960	Bottom Cover		ボトムカバー	J	080
	AA 830970	Bottom Cover		〃	U	
	AA 830980	Bottom Cover		〃	G	
	AA 831870	Bottom Cover		〃	C	
* 2	NA 813620	DM Circuit Board		DMシート	J	460
*	NA 813630	DM Circuit Board		〃	U, C	
	NA 813640	DM Circuit Board		〃	G	
3	LB 301910	Metal Fittings U-Type		U字金具		010
4	CB 068880	Plastic Rivet		プラスチックリベット	G	
5	CB 072750	Cord Stopper		コードストッパー	U, G	
	CB 806850	Cord Stopper		〃	C	
6	MG 001910	Power Cord		電源コード	J	050
	MG 000890	Power Cord		〃	U	
	MG 001200	Power Cord		〃	G	
	MG 000270	Power Cord		〃	C	
7	KA 101120	Power Switch		パワースイッチ		040
* 8	NB 830350	Transformer Assembly		トランス Ass'y	J	110
*	NB 830360	Transformer Assembly		〃	U, C	
*	NB 830370	Transformer Assembly		〃	G	
9	iL 000690	Rodiation Sheet		放熱シート		010
10	CB 072880	Insulation Bush		絶縁ブッシュ		010
11	CB 834350	Leg		ゴム脚		01*
12	CB 832930	Plastic Revet		ロッキングカードスペサー		010
13	CB 832920	Insulation Sheet		絶縁シート		040
* 14	Mi 803230	Cord Wire (DM to AN)	24P ℓ = 50 mm	スミカード		030
* 15	AA 831620	Cartridge Holder		カートリッジホルダー		020
* 16	CB 835170	Cartridge Guide		カートリッジガイド		010
17	NX 801170	Top Cover		トップカバー		140
* 18	NA 813650	PN Circuit Board		PNシート		220
19	CB 832850	Key Top (Large) Black		キートップ(A)		010
20	CB 832860	Key Top (Large) Red		〃		010
21	CB 832870	Key Top (Large) Green		〃		010
22	CB 832880	Key Top (Large) Blue		〃		010
23	CB 832890	Key Top (Small) Black		キートップ(B)		010
24	CB 832900	Key Top (Small) Gray		〃		010
25	CB 832910	Key Top (Small) Green		〃		010
26	CB 833320	Key Top (Small) Red		〃		010
27	CB 832940	Knob		ツマミ		020

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	Ref. No.	Part No.	Description		品名	Remarks	ランク
*	28	NA 813670	LC Circuit Board		LCシート		20*
	29	CA 808870	Cloth, Dust Proof		防塵クロス		030
*	30	CB 835610	PN Protect Sheet (B)		PN保護シート(B)		03*
*	31	CB 8326B0	Rear Cover		リアカバー	J	070
*		CB 832690	Rear Cover		〃	U, C	
*		CB 832700	Rear Cover		〃	G	
*	32	NA 813660	AN Circuit Board		ANシート		160
	33	MZ 820240	Wiring (DM to LC)		線材 Ass'y		070
	34	CB 069250	Binding Tie		インシュロックタイ		010
	35	CB B34360	PL Plate	A	PLプレート(A)		02*
	36	CB 834370	PL Plate	B	PLプレート(B)		02*
	37	CB 834380	PL Plate	C	PLプレート(C)		02*
	38	Ei 330106	Bind Tapping Screw	3 x 10 8L	バインドタッピンネジ		010
	39	Ei 3400B6	Bind Tapping Screw	4 x 8 BL	〃		010
	40	ED 330066	Bind Head Screw	3 x 6 BL	バインドリネジ		010
	41	EA 026086	Pan Head Screw	2.6 x 8 Ye	ナベ小ネジ		010
	42	ED 330206	Bind Head Screw	3 x 20 8L	バインド小ネジ		010
	43	EV 190400	Hexagonal Nut		フランジ付六角ナット	C	
	44	EV 413046	Toothed Locked Washer	A4.0 BL	歯付座金		010
	45	EV 203046	Plain Washer	φ4 BL	平座金		010
	46	EV 300506	Spring Lock Washer	φ5 BL	スプリングワッシャー		010
	47	EV 413036	Toothed Locked Washer	A3.0 BL	歯付座金		010
	4B	Ei 3300B6	Bind Tapping Screw	3 x 8 BL	バインドタッピンネジ		010
	49	Ei 326066	Bind Tapping Screw	2.6 x 6 BL	〃		01*
	50	GE 300710	Line Filter		フェライトリング	U, G	
	51	PC 900040	Lithum Battery	CR032	リチウム電池		042
		PC 900030	Lithum Battery		〃		04*
	55	CB 835620	PN Protect Sheet (C)		PN保護シート(C)	U, G	
	56	CB 835600	Shield Sheet		シールド紙	U, G	

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■ELECTRICAL PARTS(電気部品)

Ref. No.	Part No.	Description	品名	Remarks	ランク
*	NA 813620	DM Circuit Board	DM シート	J	460
*	NA 813630	DM Circuit Board	〃	U, C	
*	NA 813640	DM Circuit Board	〃	G	
	iG 052600	IC	74LS05	IC	031
	iG 058500	IC	7407	〃	030
	iG 050500	IC	74LS368	〃	030
*	iR 001400	IC	74HC14	〃	050
*	iR 001450	IC	74HC14N	〃 interchangeable	050
*	iR 003200	IC	74HC32	〃	030
*	iR 003250	IC	74HC32N	〃 interchangeable	030
*	iR 007400	IC	74HC74	〃	040
*	iR 007450	IC	SN74HC74N	〃 interchangeable	040
*	iR 013800	IC	74HC138	〃	050
*	iR 013850	IC	74HC138N	〃 interchangeable	050
*	iR 013900	IC	74HC139	〃	050
	iR 013950	IC	74HC139N	〃 interchangeable	050
*	iR 017400	IC	74HC174	〃	050
*	iR 017450	IC	74HC174N	〃 interchangeable	050
*	iR 024400	IC	HC244	〃	070
*	iR 024450	IC	HC244N	〃 interchangeable	070
*	iR 024500	IC	74HC245	〃	070
*	iR 037400	IC	74HC374	〃	060
	iG 068100	IC	TC40H240	〃	070
	iG 078600	IC	TC40H374	〃	070
	iG 001770	IC	TC4051BP	〃	050
	iG 055100	IC	TC4053BP	〃	050
	iG 093500	IC	HD6303RP	〃	160
	iG 106202	IC	M5M5118P-15L	〃	120
	iG 033400	IC	μPC311C	〃	051
	iG 033350	IC	μPC7805	〃	050
	iG 063910	IC	μPC7815A	〃	050
	iG 042500	IC	NJM4556	〃	040
	iG 107000	IC	NJM072D	〃	040
	iG 107100	IC	LF356N	〃	050
	iG 116200	IC	PST518	〃	040
	iG 116100	IC	NEL-D32-43	〃 POWER FOREL	100
	iT 219010	IC	YM2190-1	〃 WAVE ROM	100
	iT 219020	IC	YM2190-2	〃 WAVE ROM	100
	iT 219030	IC	YM2190-3	〃 WAVE ROM	100
*	iT 219050	IC	YM2190-5	〃 WAVE ROM	100
*	iT 219060	IC	YM2190-6	〃 WAVE ROM	100
	iT 219070	IC	YM2190-7	〃 WAVE ROM	100
	iT 215400	IC	YM2154	〃 RYP-4	140
*	iT 301000	IC	YM3010	〃 DAC	100
*	iN 009500	IC	HN4827128	〃 PROM IC213	190
*	iN 009600	IC	HN4827128	〃 PROM IC214	190
	iA 095010	Transistor	2SA950 (O, Y)	トランジスター	031
	iA 099900	Transistor	2SA999 (E, F)	〃	031
	iC 181570	Transistor	2SC1815 (O, Y)	〃	031
	iC 287800	Transistor	2SC2878 (A, B)	〃	031

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Ref. No.	Part No.	Description		品名	Remarks	ランク
	i F 000040	Diode	IS1555	ダイオード		010
	i F 005120	Diode	MC931	〃		010
	i F 005700	Zener Diode	RD5.1EB2	ツェナーダイオード		010
	i H 000870	Bridge Diode	4D4B41	ブリッジダイオード		040
	i H 000970	Bridge Diode	IS2371A	〃		030
	HZ 003190	Resistor Network	4.7K x 8	モジュール抵抗		010
	F i 364220	EMI Filter		エミフィン		020
	FP 137100	Capacitor Tantalume	0.022 10/16	タンタルコン		020
	FZ 005030	Ceramic Cap.	0.1	半導体セラコン		010
	UW 828100	Electrolytic Cap.	100/10	ケミコン		010
	UW 828220	Electrolytic Cap.	220/10	〃		010
	UW 837470	Electrolytic Cap.	47/16	〃		010
	FZ 003650	Electrolytic Cap.	4700/16	〃		050
	UW 857100	Electrolytic Cap.	10/35	〃		010
	UW 857220	Electrolytic Cap.	22/35	〃		010
	UW 858100	Electrolytic Cap.	100/35	〃		010
	UW 858220	Electrolytic Cap.	220/35	〃		020
	UW 559100	Electrolytic Cap.	1000/35	〃		030
	UW 866470	Electrolytic Cap.	4.7/50	〃		010
	UK 166100	B.P Cap.	1/50	BPコン		010
	KB 000310	Fuse	0.5A 250V	ヒューズ	J	010
	KB 000350	Fuse	2A 250V	〃	J	010
	KB 000710	Fuse	T500mA 250V	〃	G	020
	KB 000750	Fuse	T2A 250V	〃	G	020
	KB 001150	Fuse	0.5A 250V	〃	U, C	030
	KB 001240	Fuse	2A 250V	〃	U, C	030
	i K 000420	Photo Conductor	PC900	フォトカプラー		050
	GE 300350	CHOKE Coil	68μH	チョークコイル		010
	HT 370010	Pre-Set Potentiometer	B1K	半固定VR		021
	KA 401230	Slide Switch		スライドスイッチ	G	
	QU 004800	Ceramic Lock	4MHz	セラロック		030
	QU 007200	Ceramic Lock	2.7MHz	〃		030
	LB 918060	Connector	6P	コネクターXH	CN206	010
	LB 918140	Connector	14P	〃	CN204	020
*	LB 607160	Connector	24P	カードフィット	CN205	050
*	LB 607210	Connector	15P	〃	CN202	030
*	LB 607370	Connector	27P	〃	CN203	050
	LB 301450	Connector	3P	ウェハアッセンブリー	CN208, 209	010
	LB 400890	Connector	4P	〃	CN207	020

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Ref. No.	Part No.	Description		品名	Remarks	ランク
	LB 603970	Connector	6P	ウェハアッセンブリー	CN210	020
	LB 000730	Jack Mini-Type	S-G8036	ジャック	TAPE in, out	010
	LB 202600	Jack Phone	MONO	〃	Foot sw, L, R out	020
	LB 202300	Jack Phone	STEREO	〃	PHONES	020
	LB 500520	Socket, DIN-Type		DIN ソケット	Midi in, out	031
	LB 606050	Socket, IC	28P	IC ソケット	For ROM	05*
	LB 605350	Socket, Connector	28P	コネクターソケット	For CARTRIDGE	07*
	LB 201530	Fuse Holder Pin		ヒューズホールダーピン		010
*	CB 833540	Cartridge Spacer		カートリッジスペーサー		010
	NA 813650	PN Circuit Board		PNシート		220
	iF 000040	Diode	1S1555	ダイオード		010
	iF 003770	LED	SLP144B-40	LED	SONG, PAT, RUN	020
	iF 004930	LED	7SEG	数字表示用LED		05*
*	iF 007770	LED	RED	面発光LED赤		040
*	CB 834720	LED Spacer		LEDスペーサー		020
	HQ 420490	Slide Valiable Resistor	B10K	スライドVR	TEMPO, DATA	030
	HQ 420500	Slide Valiable Resistor	A10K & x 2	〃	VOLUME	040
	KA 906670	Key Switch		キーストロークスイッチ		030
*	LB 607220	Connector	15P	カードフィット	CN2	030
*	LB 607380	Connector	27P	〃	CN1	050
*	Mi 803220	Card Wire	15P	スミカード	CN2	030
*	Mi 803280	Card Wire	27P	〃	CN1	040
	NA 813660	AN Circuit Board		ANシート		160
	iG 001390	IC	NJM4558DV	IC		030
	FZ 005030	Ceramic Cap.	0.1μ 25V	半導体セラコン		010
	UW 857100	Electrolytic Cap.	10/35	ケミコン		010
	UW 847470	Electrolytic Cap.	47/25	〃		010
*	LB 607170	Connector	24P	カードフィット	CN101	050
	LB 202600	Jack Phone	Mono	ジャック	OUTPUT	020

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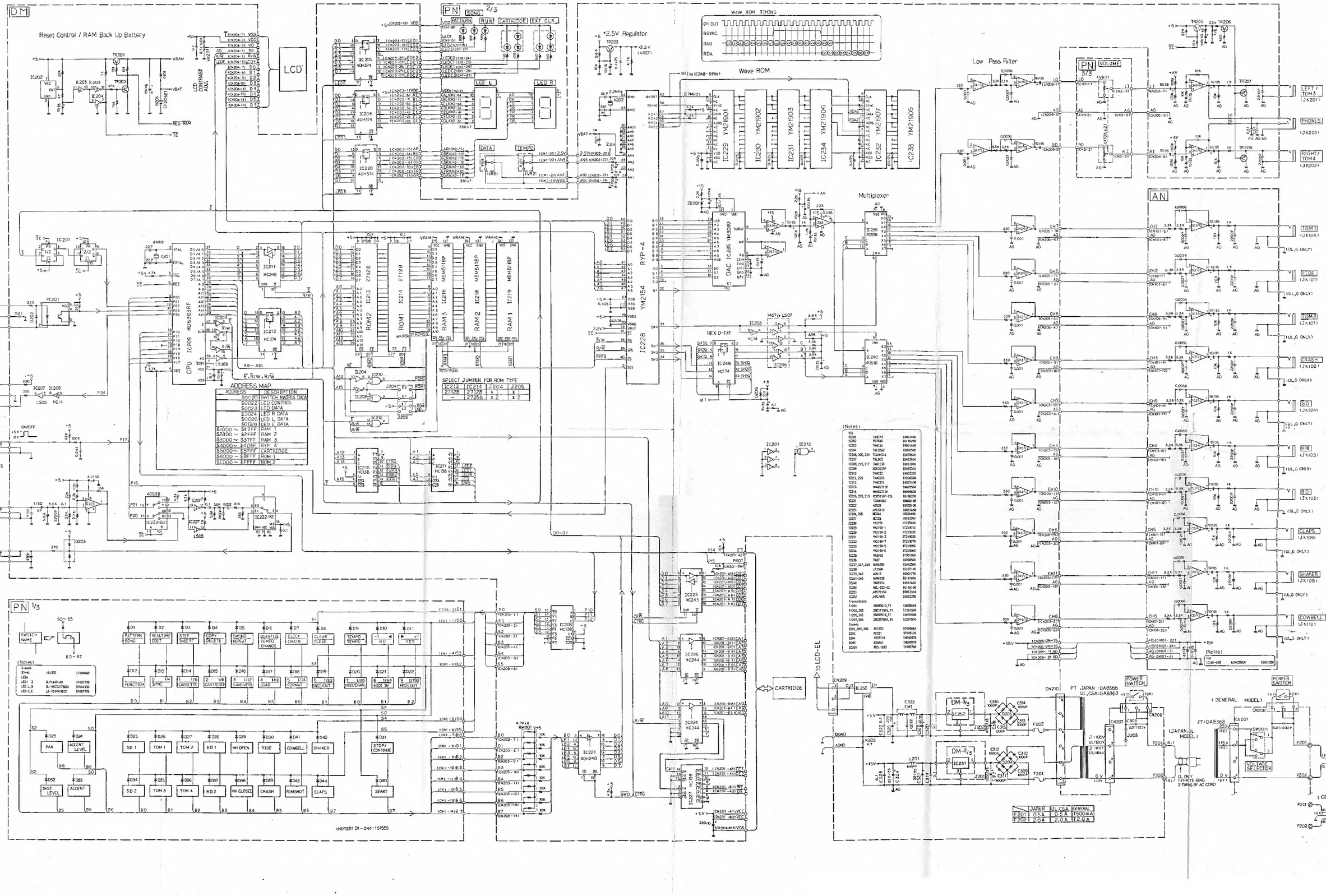
RX11 OVERALL CIRCUIT DIAGRAM 006612